PB86-133980

Superfund Record of Decision (EPA Region 2)
Olean Well Field, Cattaraugus County, New York
September 1985

(U.S.) Environmental Protection Agency
Washington, DC

24 Sep 85

U.S. Department of Commerce
National Technical Information Service
NTIS

United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R02-85/015
September 1985

PB86-133980

EPA

Superfund Record of Decision:

Olean Well Field, NY

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

TECHNICAL REPORT DATA *(Please read Instructions on the reverse before completing)*		
1. REPORT NO. EPA/ROD/R02-85/015	2.	3. RECIPIENT'S ACCESSION NO. PB86 133980/AS
4. TITLE AND SUBTITLE SUPERFUND RECORD OF DECISION Olean Well Field, NY		5. REPORT DATE September 24, 1985 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT NO. 11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS U.S. Environmental Protection Agency 401 M Street, S.W. Washington, D.C. 20460		13. TYPE OF REPORT AND PERIOD COVERED Final ROD Report 14. SPONSORING AGENCY CODE 800/00

15. SUPPLEMENTARY NOTES

16. ABSTRACT

The Olean Well Field is located in the eastern portion of the City of Olean, and also encompasses part of the Town of Olean, in Cattaraugus County, New York. Early in 1981, the three municipal wells (Well numbers: 18M, 37M and 38M) at the site were found to contain levels of trichloroethylene (TCE) at concentrations above the New York State Department of Health (NYSDOH) Drinking Water Guidelines (50 ppb). These wells were closed and an old surface water filtration plant was reactivated to provide water to city residents. Private wells in the area were subsequently tested and many were found to be contaminated. Approximately one half of the contaminated private wells have shown TCE levels of over 1,000 ppb. The highest level of TCE detected in a private well was 3,100 ppb (sample taken June 1985).

The selected remedial action for this site includes: reactivating the municipal wells and constructing a packed tower air stripping system north of the Allegheny River at municipal well 18M to treat the ground water to a maximum contaminant level (MCL) of 5 ppb for TCE; construction of a similar air stripping system south of the river to treat water from wells 37M and 38M; discharging all treated water into the public water supply system; extending the City of Olean water lines into the Town of Olean and hooking up 93 private well users to the public water supply system; inspecting the McGraw-Edison industrial sewer and analyzing repair and replacement options;
(see separate sheet)

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Record of Decision Olean Well Field, NY Contaminated Media: gw Key contaminants: trichloroethylene (TCE), VOCs		

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS (*This Report*) None	21. NO. OF PAGES 42
	20. SECURITY CLASS (*This page*) None	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

Abstract - continued

recommending institutional controls restricting the withdrawal of ground water for drinking purposes where MCLs are exceeded; and initiating a supplemental Remedial Investigation and Feasibility Study to evaluate source control measures. Total capital cost for the selected remedial alternative is estimated to be $1,996,780 with O&M costs approximately $799,040 per year.

RECORD OF DECISION

Remedial Alternative Selection

Site: Olean Well Field, Olean, Cattaraugus County, New York

Documents Reviewed:

I am basing my decision primarily on the following documents describing the analysis of cost-effectiveness of remedial alternatives for the Olean Well Field Site:

- Olean Well Field Remedial Investigation
- Olean Well Field Feasibility Study
- Staff Summaries and Recommendations
- Responsiveness Summary

Description of Selected Remedy:

This Record of Decision calls for the following actions:

° Reactivate the municipal wells and construct a packed tower air stripping system north of the Allegheny River at municipal well 18M to treat the ground water to a maximum contaminant level of 5 ppb for TCE. This level is as close to the Recommended Maximum Contaminant Level (RMCL) for TCE as is technically feasible while providing a high level of protection to the public. Also construct a similar system south of the river to treat water from wells 37M and 38M. All treated water will be discharged into the public water supply system.

° Extend the City of Olean water lines into the Town of Olean and hook up 93 private well users to the public water supply system (90 private wells north of the Allegheny River and 3 private wells south of the river).

° Inspect the McGraw-Edison industrial sewer and analyze repair and replacement options.

° Recommend institutional controls restricting withdrawal of ground water for drinking purposes where maximum contaminant levels (MCL) are exceeded.

° Initiate a supplemental Remedial Investigation and Feasibility Study to evaluate source control measures. The duration of the ground water treatment period will be projected as part of this additional study.

Declarations:

Consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and the National Contingency Plan (40 CFR Part 300), I have determined that the placement of air strippers on the City of Olean municipal wells, the hookup of 93 private well users to the public (City) water supply, as well as inspection of the McGraw-Edison industrial sewer and analysis of repair or replacement options at the Olean Well Field site is a cost-effective remedy and provides adequate protection of public health, welfare and the environment. Furthermore, I have determined that it is necessary to undertake a limited, supplemental Remedial Investigation and Feasibility Study to evaluate source control measures. A determination regarding future source control actions will be made upon completion of this work.

The State of New York has been consulted and agrees with the approved remedy. In addition, the action will require future operation, maintenance, and monitoring activities to ensure the continued effectiveness of the remedy. These activities will be considered part of the approved action and eligible for Trust Fund monies for a period of one year.

I have also determined that the action being taken is appropriate when balanced against the availability of Trust Fund monies for use at other sites.

September 24, 1985
Date

Christopher J. Daggett
Regional Administrator

SUMMARY OF
REMEDIAL ALTERNATIVE SELECTION

SITE: Olean Well Field

SITE LOCATION AND DESCRIPTION

The Olean Well Field is located in the eastern portion of the City of Olean, and also encompasses part of the Town of Olean. The City and Town of Olean are in Cattaraugus County, New York, approximately 65 miles southeast of Buffalo (see Figure 1). Residences, industrial and commercial establishments, as well as an abandoned landfill are located within the site's boundaries. The Allegheny River, one of its tributaries (Haskell Creek), and some streams flow through the site. Two aquifers exist beneath this area. The relatively thin upper aquifer is generally composed of sand with some gravel and silt. It begins just south of the AVX Ceramics Corp., extends southward to the Allegheny River and resumes again south of the river. The lower or City aquifer, composed of sands and gravels, extends beneath the entire site and provides water for three municipal wells which, until 1981, served as the primary source of drinking water for the City's 20,000 residents. Private wells in the Town are also screened in the aquifers. The upper and lower aquifers are separated by a less permeable layer or aquitard, composed of glacial till containing approximately 50% silt and clay.

SITE HISTORY

Early in 1981, the three municipal wells (18M, 37M, & 38M) at the site were found to contain levels of trichloroethylene (TCE) at concentrations above the New York State Department of Health (NYSDOH) Drinking Water Guidelines (50 ppb). These wells were closed and an old surface water filtration plant was reactivated to provide water to city residents. Private wells in the area were subsequently tested and many were also found to be contaminated.

CERCLA immediate removal actions were conducted prior to and during the RI/FS in response to unacceptable levels of contamination in private wells. In 1982, EPA performed an immediate removal action which entailed monitoring of private wells and installation of one cubic foot carbon filters on 16 private wells. In 1984, EPA initiated a second immediate removal action which included the installation of eleven (11) carbon adsorption units consisting of two 3-cubic foot filters in series and a monitoring program. The replacement of one of the original filters, which had suffered breakthrough, was included in the 11 systems. These filter systems were

designed in accordance with NYSDOH 1984 guidelines. A third removal action was implemented in March 1985 and involved installation of 2 filter systems similar to those installed in 1984.

Focused Feasibility Study/Initial Remedial Measure

In 1984, a Focused Feasibility Study was undertaken by New York State Department of Environmental Conservation (NYSDEC) in order to develop an interim program which would minimize the public health risk to users of private wells which were contaminated or threatened by the movement of the contaminant plume. The study recommended upgrading the 15 remaining 1-cubic foot carbon filter systems to two 3-cubic foot carbon filters in series, installing 3 new carbon filter systems similar in size to the upgraded systems, and setting aside funds for 4 additional systems to be used as necessary. Maintenance and monitoring of the above filter systems and monitoring of unfiltered private wells within the area of concern were also recommended. It was agreed that the State of New York would take over the maintenance and monitoring costs after one year until such time that the remedial alternative is implemented. These recommendations were authorized on April 4, 1985 and implementation began in June 1985.

Remedial Investigation

During the remedial investigation 19 monitoring wells were installed around the study area. Analyses of the hydrogeology within the site's boundaries show that there are two aquifers separated by an aquitard of varying thickness comprising the upper 100 feet of the Allegheny River Valley. It was determined by utilizing groundwater elevations that the natural gradient of the upper and lower aquifers is extremely flat. The upper aquifer flows toward and discharges into the Allegheny River and the lower or City aquifer flows in a southwesterly direction. When the municipal wells are pumping, ground water flow in the lower aquifer is accelerated and the gradient is significantly increased due to the large cone of influence of the wells.

Chemical analyses of the ground water show that the contaminant plume is widespread throughout both aquifers and forms a triangle loosely defined by Alcas Cutlery to the west, AVX Corp. to the north, and McGraw-Edison to the east. The plume is composed primarily of TCE with some upper aquifer wells also showing lower levels of other volatile organics such as 1,1,1 trichloroethane and trans-1,2-dichloroethylene. (See Figures 2 and 3 and Tables 1 and 2 for monitoring well data and industrial site data.)

TCE is a suspected carcinogen and a known cause of liver and kidney damage and central nervous system depression. The highest concentrations of TCE contamination appear to be located in the upper portion of the lower aquifer and in areas of the upper aquifer. This is of great concern since the majority of private wells are screened in the upper portion of the lower aquifer.

Contamination migration in the study area occurs primarily in the subsurface environment. Contaminants entering the upper aquifer are transported both horizontally [v_h=50 ft/day], towards the river, and vertically [v_v=10 ft/day], downward through the upper aquitard [k_h=1.0 ft/day; k_v=0.001 ft/day] and into the lower aquifer. In the lower aquifer, movement is directed to the west and southwest and can be fairly rapid when the municipal wells are pumping. (The above-stated values are based on a modelling study performed for EPA by INTERA Technologies.)

In addition to contaminating the 3 municipal wells, the TCE plume, to date, has also heavily contaminated over 30 private wells in the study area. The levels of well water contamination have fluctuated greatly since monitoring began in 1982. Approximately one half of the contaminated private wells have shown TCE levels of over 1,000 ppb. The highest level of TCE detected in a private well during the most recent (June 1985) monitoring run was 3,100 ppb.

ALTERNATIVES EVALUATION

Objectives

The objectives of the proposed remedial action are to provide a permanent and safe drinking water supply for the City and Town of Olean, and to mitigate and control contamination in the ground water. The level of response for NPL sites is determined by the requirements of CERCLA Section 104, which mandates EPA to protect public health and welfare and the environment. At this site, the level of response is dictated by the desire to keep the public health risk set at a level at which no known or anticipated adverse effects occur and which allows an adequate margin of safety. Also, it is necessary to choose a level that is technically feasible and detectable using the best technology that has a low margin of error. Therefore, it is recommended that 5 ppb, the highest level of TCE allowable in the drinking water that best supports the above and is consistent with a 10^{-6} risk level, be utilized for the remedial action. (Reduction of TCE to a level of 5 ppb should also reduce other contaminants sufficiently to comply with the 10^{-6} risk level. However, monitoring will determine the effectiveness of the treatment system in meeting this

requirement. If the levels of other contaminants are above acceptable risk levels then the operating parameters of the treatment system will be adjusted accordingly.

The objective of the proposed supplemental source control RI/FS is to determine which, if any, source control measures would be cost-effective.

Alternative Screening Process

Remedial alternatives were initially divided into the following three categories: Public Water Supply, Private Water Supply and Groundwater Contamination Control. Any overlaps among the sets of alternatives were eliminated in the recommended alternative. All remedial alternatives were screened in a two-phase process. The first phase was based primarily on engineering judgement. Alternatives were rated on cost, environmental impact, public health risk, regulatory compliance and technology. Alternatives passing the initial screening process were then reevaluated in greater detail during the second phase. All considered alternatives are listed on Tables 4 a, b, and c.

No Action Alternative

Selection of the "No Action" alternative would preclude further Trust Fund expenditures for remedial action. This alternative consists of retaining the status quo at the site, i.e., continued operation of the surface water treatment plant and continued use of the existing carbon adsorption systems on private wells. However, there would be no future installations or monitoring and maintenance programs. This alternative was eliminated for the following reasons:

- The City of Olean water supply would be endangered because of the uncertain reliability of the surface water treatment plant;
- The private well users in the Town of Olean would continue to be threatened by the contaminant plume;
- Plume migration would not be controlled, thereby threatening the St. Francis municipal wells downgradient of the site, which augment the City's water supply;
- Ground water contamination would not be alleviated;
- O&M costs for the surface water treatment plant are high.

Another no action scenario that was considered and eliminated, because it did not effectively reduce the risk to public health, was the reactivation of wells 18M, 37M and 38M without

treatment of the ground water. Since previous observed levels of TCE contamination in the municipal wells were in the 200 ppb range, this scenario would result in public health risks well above the 10^{-6} risk level.

Detailed Analysis

The detailed analysis of the remaining alternatives included a review of technical feasibility, regulatory and permit requirements, public health analysis, community relations, institutional analysis and cost analysis. In order to compare each alternative on an equal basis, the total costs for supplying the City and Town with water were developed. Costs unrelated to the TCE contamination problem were deducted after the lowest cost alternative was chosen. Cost estimates for each alternative were developed at the same level of detail. Annual operation and maintenance costs were also estimated where appropriate. Present worth calculations, as shown on Tables 5A and 5B, include annual O&M costs and assume a 30 year life span. The project life span may change as a result of future source control analyses.

The following is a discussion of the various alternatives considered during the RI/FS and retained after the initial screening. Tables 5A and 5B summarize the remaining remedial alternatives. The present worth calculations listed on these tables should also be used to compare the cost-effectiveness of these alternatives. As previously stated, the alternatives have been grouped into the following three general categories for the purpose of simplication: (1) City or public water supply; (2) Town or private water supply; and (3) Ground water contamination control.

City or Public Water Supply

Various alternatives whose goal was to provide a permanent and safe drinking water supply while satisfying the peak water supply demands of the City of Olean were analyzed. These alternatives are described below.

- Construction of a surface water treatment plant to replace the aged plant currently in use was considered a viable option. A conceptual design of the plant was used as a basis for the cost estimate. That design included the capacity to generate enough water to serve the users of the private Town wells within the study area, if necessary. This plan entailed the highest overall cost and also would have necessitated a plume management program. A plume management program would use one or more pumping wells to control and/or stop the movement of the plume.

° Utilizing the existing municipal wells (18M, 37M, & 38M) and treating the ground water to acceptable risk levels was also considered. The demonstrated technologies for treatment of ground water which is contaminated with TCE and related volatile chlorinated solvents are air stripping and activated carbon adsorption systems. Three alternatives were evaluated for treatment of ground water for use as the public water supply. These alternatives are packed tower air stripping (the recommended alternative), packed bed granular activated carbon adsorption systems and packed tower air strippers combined with activated carbon adsorption systems.

Since the municipal wells are located on both sides of the Allegheny River, analyses were done to determine the most economical location of the treatment system(s). The construction of a water pipeline under the river in conjunction with a single water treatment system was analyzed and eliminated due to the increased expenses associated with river construction. It was concluded that the most feasible cost effective approach would be to build one treatment system north of the river near well 18M and another system south of the river near wells 37M and 38M.

The air stripper towers were designed assuming a maximum TCE concentration in the influent of 750 ppb. Even though the highest TCE concentration detected in the municipal wells has been 210 ppb, this assumed concentration level was deemed necessary to sufficiently treat the high levels of TCE seen in other areas of the aquifer and till that may arrive at the municipal wells.

The carbon adsorption systems, while technically feasible, have a much higher capital cost and are also more expensive to maintain than air strippers.

° The last remaining alternative considered for the public water supply was the construction of new municipal wells beyond the contaminated area. These new wells would also be capable of supplying water to the users of the private Town wells within the area of concern, if necessary. Determining the exact location of these new wells was deemed beyond the scope of this study. Therefore it was assumed for economic purposes that these wells would be located within a 5 mile radius of the City but outside the contaminated ground water areas in West Olean (ammonia and chromium contamination unrelated to this site) and East Olean.

Town or Private Water Supply

Four alternatives were retained for detailed analysis. These alternatives can be grouped into two categories: continued use of carbon filter systems on private wells and the connection of private users to the public or City water supply.

° The continued monitoring of filtered and unfiltered private wells within the area of concern, installation of carbon adsorption systems as necessary, and maintenance of new and existing filter systems were analyzed in detail. A variation of this alternative was also considered, the difference being the placement of carbon adsorption system on all private wells within the area of concern. These alternatives allow for the possible risk of short-term exposure to volatile organic carbons prior to a new installation and/or at the end of a maintenance cycle. Frequent monitoring and maintenance is necessary to minimize the risk of short-term exposure to VOC's, thereby raising O&M costs significantly.

° Connection of private users to the Public or City water supply is the alternative that is the most cost-effective and requires the least maintenance. Two versions of this alternative were analyzed for cost-effectiveness. Each version also necessitates the need for establishment of a water district in the Town of Olean.

The first version would hook up all users located in Zone 1 (50 hookups; see Figure 4). Zone 1 contains those private wells which show the highest levels of contamination. Private wells in Zones 2, 3, and 4 would continue to be monitored for contamination. These wells would also continue to have their existing carbon filter systems monitored and maintained and new systems installed, as necessary. In addition to having high maintenance costs, this alternative would not eliminate the risk of short-term exposure in Zones 2, 3 and 4.

The second version of this alternative would extend the City water line to Zones 1, 2 and 4 (93 hookups). Zone 3 would continue to receive monitoring. While this alternative has a higher capital cost, it is less expensive over the life of the project since monitoring costs are lower. This alternative best protects public health by connecting all private wells with the highest risk of contamination.

Ground Water Contamination Control

Various ground water contamination control alternatives were analyzed in the RI/FS. However, EPA has determined that the data used in the RI/FS was insufficient to accurately analyze remediation of the contaminated soils and ground water. Given the high concentrations of VOCs at the industrial sites, further study is necessary to better delineate contaminated soil areas and to determine the most cost-effective source control actions.

The RI/FS addressed the industrial sewer that crossed the study area (See Figure 5 - Location Map). Flow studies conducted during the RI/FS process showed that the sewer exfiltrates (loses water) in some sections and infiltrates (gains water) in others. Although these data do not accurately reveal the areas of interaction between the sewer and the ground water, they do show that the sewer can act as a conduit for contaminated ground water. The sewer also may be a source of TCE contamination, since TCE concentrations as high as 14,000 ppb recently have been detected in the sewer. It is recommended that the sewer be inspected and repair or replacement options be evaluated based on the results of the inspection.

Recommended Alternative

The recommended remedial alternative is the lowest cost alternative that is technologically feasible and reliable and provides adequate protection of public health, welfare and the environment. Table 6 contains a cost breakdown of the recommended alternative.

The recommended alternative consists of initially treating the ground water to 5 ppb for TCE by placing air strippers on the municipal wells and discharging the treated water into the City drinking water system, and extending the City water lines to the Town and hooking up 93 private wells, including three residences south of the Allegheny River currently using carbon adsorption systems. Monitoring of private wells in Zone 3 (north of the areas known to be contaminated) will continue, and carbon adsorption units will be installed as necessary. The McGraw-Edison industrial sewer will also be inspected and repair or replacment options analyzed since its role in dispersing contaminants introduced into it is unknown. It is known that high levels of TCE have been found in the sewer and that it infiltrates and exfiltrates at different sections along its length. It is also recommended that institutional controls be established prohibiting withdrawal of ground water from portions of the aquifer where the level of TCE contamination is greater than 5 ppb.

This recommended option provides the best protection to public health by removing the risk of exposure to contamination in unfiltered and filtered wells within the area of concern. The aquifer will also be treated and the plume managed as approximately 3.25 million gallons per day of water are stripped of contaminants.

The need for source control, which may include options such as capping, treating or excavating contaminated soil, will be evaluated following further field work to better delineate contaminated areas on the industrial sites. Also, further sampling will be performed to determine if the Seneca Avenue landfill is or was a source of contamination. These activities need to be initiated in order to determine whether source control measures will expedite the treatment of the contaminated aquifer, and to identify if another possible source of contamination exists which may necessitate further action.

Enforcement Analysis

Six Potentially Responsible Parties (PRPs) have been identified to date. Three industrial facilities in the Olean area have been identified as sources of volatile organic contamination to the Olean Well Field: Alcas Cutlery, AVX Ceramics and McGraw-Edison. Investigatory work was performed by each of these companies at their respective facilities under Resource Conservation and Recovery Act (RCRA) §3013 Consent Orders. The results of those studies indicate soil and groundwater contamination at each of the facilties (See Table 3).

Notice Letters have been issued to each of these companies and, in addition, to Cooper Industries, present majority stock holder of McGraw-Edison, and Aluminum Company of America (Alcoa) and W.R. Case Cutlery and Sons, owners of Alcas during the period of disposal at the Alcas facility.

EPA has initiated negotiations with the PRPs. While the PRPs have not rejected EPA's invitation to design and implement the recommended alternative, disagreement among the PRPs over apportionment appear to be impairing the settlement process. In July 1985, EPA imposed a September 15 deadline for PRPs to commit to implementation of the recommended alternative. This deadline has passed without a substantial offer from the PRPs. EPA will consider issuing an order under Section 106 of CERCLA directing the PRPs to perform all activities set forth in the Record of Decision.

Community Relations

The media and local officials have shown interest in the site. A Citizen's Advisory Committee (CAC) was established in April 1984 to serve as a link between the community and the NYSDEC and USEPA during the RI/FS process.

The CAC was concerned about the prospect that the responsible parties, i.e. local industry, would eventually have to pay for the remedial measures. The CAC generally has expressed interest in limiting government expenditures in Olean so as to relieve the potential burden on industry, apparently fearing loss of jobs and tax base. Further, the recommended alternative necessitates cooperation between the City and the Town of Olean. While this in not an impossible task, it does raise some institutional issues among the local governments.

Specific concerns raised during the public comment period are listed in the Responsiveness Summary.

Consistency with Other Environmental Laws

All facets of the proposed action will be consistent with the technical requirements of other environmental laws. Operation of air strippers for the treatment of contaminated ground water will be conducted consistent with the appropriate Clean Air Act requirements for emissions of volatile organics into the air.

Future Actions

A second operable unit consisting of source control remedial measures may be conducted following the supplemental RI/FS and issuance of a subsequent EPA Record of Decision. Source control measures may be cost-effective to expedite the treatment of the contaminated ground water.

OPERATION & MAINTENANCE (O&M)

Activities

Public (or City) Water Supply

- Bimonthly influent/effluent analysis for VOCs.
- Daily equipment flow, pressure, temperature logging, and general equipment observation.
- Annual fan and pump maintenance inspection as per manufacturers' instructions.

Private (or Town) Water Supply

- Maintenance and miscellaneous repairs to water line, as necessary.
- Monitor selected unfiltered private wells in Zone 3.

Ground Water Control

- Quarterly monitoring and maintenance of monitoring wells.

Reporting

- Bimonthly consolidation and reporting of sampling data (public, private & monitoring wells).

Future Actions

- Operate and maintain ground water treatment systems year round.

SCHEDULE

Approve Remedial Action 9/85

Initiate Negotiations with PRPS 7/85

NEGOTIATIONS SUCCESSFUL		NEGOTIATIONS UNSUCCESSFUL**	
Sign Consent 106 AO		Amend Cooperative Agreement	9/85
		Select Contractor	12/85
Design initiated	*	Negotiate Contract	2/86
		Approve Contract	8/86
Construction Initiated	*	Complete Design of Recommended Alt. w/ Plans & Specs.	12/86
Construction Completed	*	Construction Initiated	4/87
		Construction Completed	12/87

* Depends upon outcome of negotiations.

** This schedule assumes the availability of funds in September, 1985.

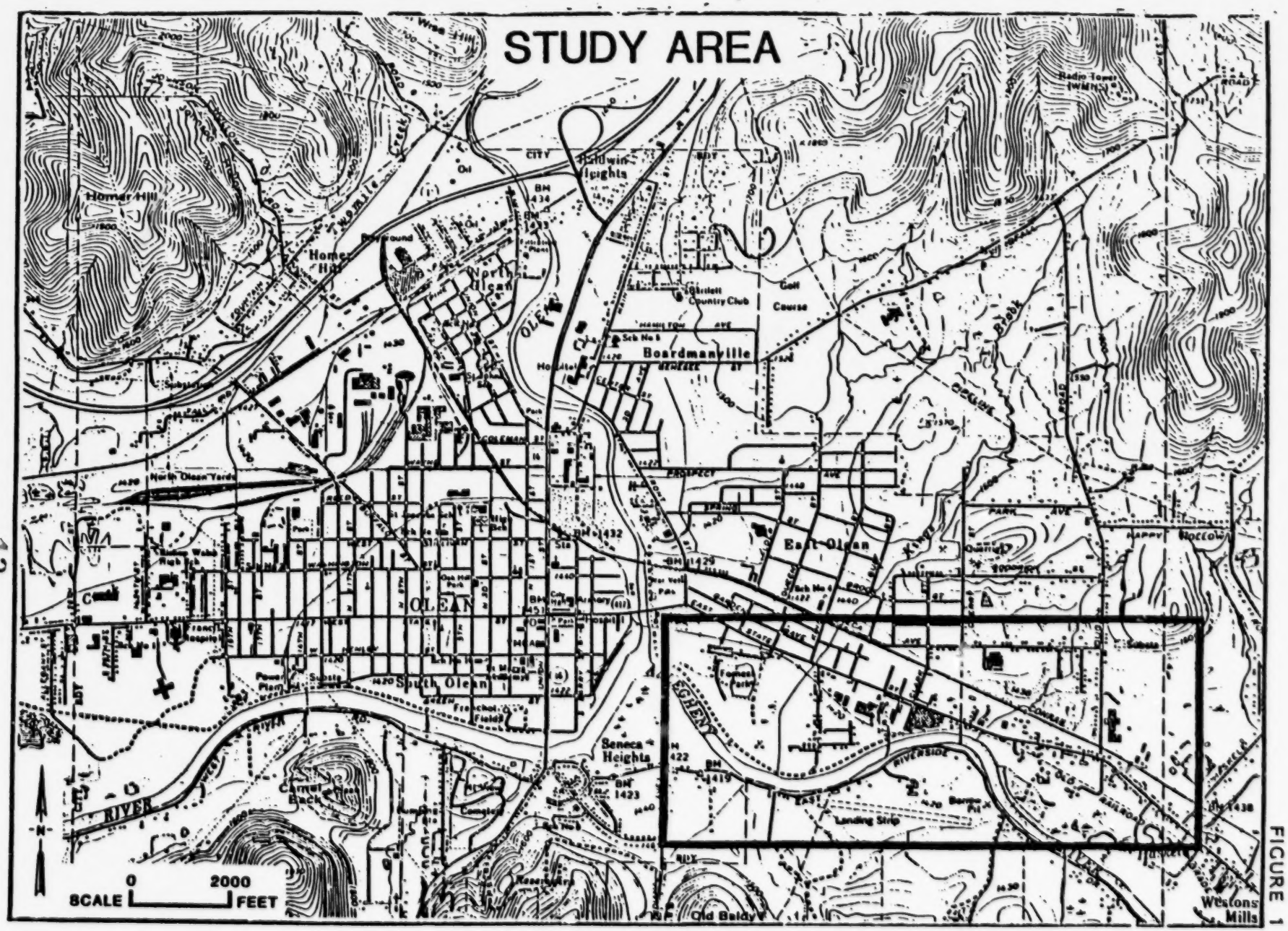
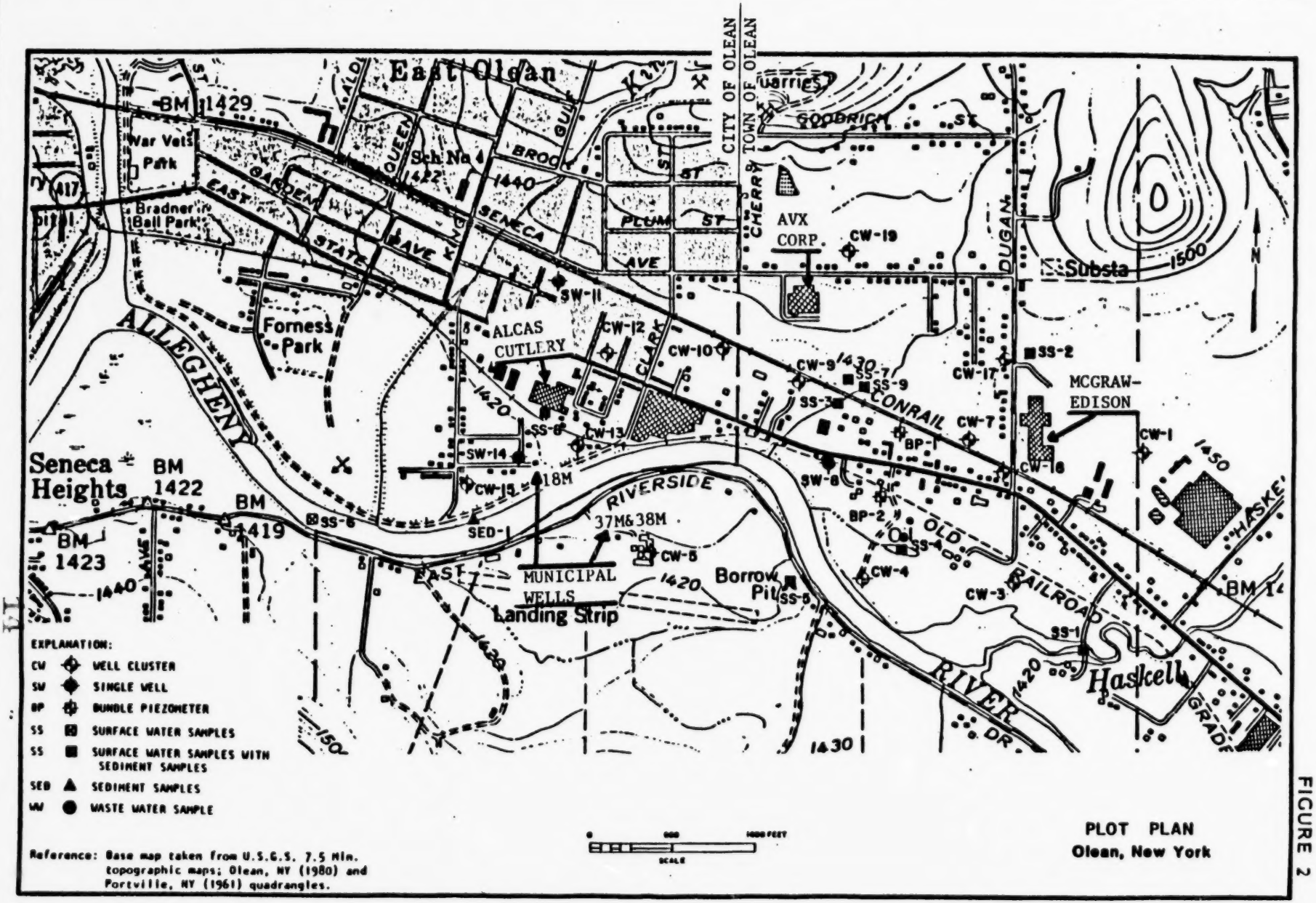


FIGURE 1

Reproduced from best available copy.



PLOT PLAN
Olean, New York

FIGURE 2

TABLE 1A

RESULTS OF FIRST-ROUND SAMPLING AND ANALYSIS OF GROUNDWATER FOR CHEMICAL PARAMETERS

Aquifer Unit	Well I.D.	Trichloro-ethylene	Tetrachloro-ethylene	1,2-dichloro-ethylene	1,1-dichloro-ethylene	1,1,1-trichloro-ethane	1,1-dichloro-ethane	Chloroform	Phenols	Lead	Other
N.Y. State "GA" Groundwater Standard		10	2	(50)*	(50)*	50	50	100	1	25	
Upper Aquifer	CW-1A	29(26)	<2	<2	<2	<2(<4)	<2	<2			
	CW-1B	24	<2	<2	<2	<1A	<2	8			
	CW-3B	3	<2	<2	<2	<2	<2	<2			
	CW-4A	550(330)	<2	12(3)	<2	160(<30)	4(<2)	<2			
	CW-5A	<2	<2	<2	<2	<2	<2	<2			
	CW-7A	230(290)	<2	24(35)	<2	<30(<35)	<2	<2	<1	412**	
	SW-8	<2	<2	<2	<2	<2	<2	<2			
	CW-10B	<2	<2	<2	<2	<2	<2	<2			
	CW-12B	<2	<2	<2	<2	<2	<2	<2			
	SW-14	160(150)	<2	84(130)	<2	<2	<2	<2			
	CW-15A	190	<2	280	<2	<2	<2	<2	<1	<200**	
	CW-18A	3400	22	220	17	180	22	<2			
Upper Aquitard	CW-13A	<2	<2	<2	<2	<12	<2	5	<1	1100**	
Upper Portion of Lower Aquifer	CW-3A	<2	<2	<2	<2	<10	<2	<2	<1	<200**	Toluene = 12
	CW-7	85	<2	<2	<2	<30	<2	<2	4	8**	
	CW-9A	630	<2	<2	<2	<10	<2	<2	<1	43.5**	
	CW-10A	19	11	77(84)	<2	<2	<2	<2	<1	36.5**	
	CW-12A	<2	<2	<2	<2	<2	<2	<2			
	CW-17B	<2	<2	<2	<2	<2	<2	<2			
	CW-19A	<2	<2	<2	<2	<2	<2	41	<1	<200**	
Mid-Portion Lower Aquifer	CW-17A	<2	<2	<2	<2	<2	<2	<2	<1	<200**	
Lower Portion of Lower Aquifer	CW-1	<2	<2	<2	<2	<2	<2	<2			
	CW-3	3	<2	<2	<2	<20	<2	<2			
	CW-4	5(4)	<2	<2	<2	<2(<20)	<2	<2			
	CW-5	5(4)	<2	<2	<2	<4	<2	<2			
	CW-9	230	<2	<2	<2	<2	<2	<2	10	<2**	
	CW-10	250(210)	<2	<2	<2	<23	<2	<2	<1	<2**	
	SW-11	<2	<2	<2	<2	<2	<2	<2			
	CW-12	120	<2	<2	<2	<2	<2	<2			
	CW-13	49	<2	<2	<2	<2	<2	<2	<1	<200**	
	CW-15	2	<2	<2	<2	<2	<2	<2			
	CW-17	<2	<2	<2	<2	<4	<2	18			
	CW-18	350	<2	7	<2	<7	<2	<2			
	CW-19	<2	<2	<2	<2	<2	<2	<2			

All values are in parts-per-billion.

* N.Y. State Dept. of Health maximum permissible concentration for individual synthetic organic chemicals in drinking water.

** First-Round Samples Were Unfiltered. Particulate (Insoluble) lead was thus counted in the analysis.

Replicate analyses shown in parentheses.

Reproduced from best available copy.

TABLE 1B

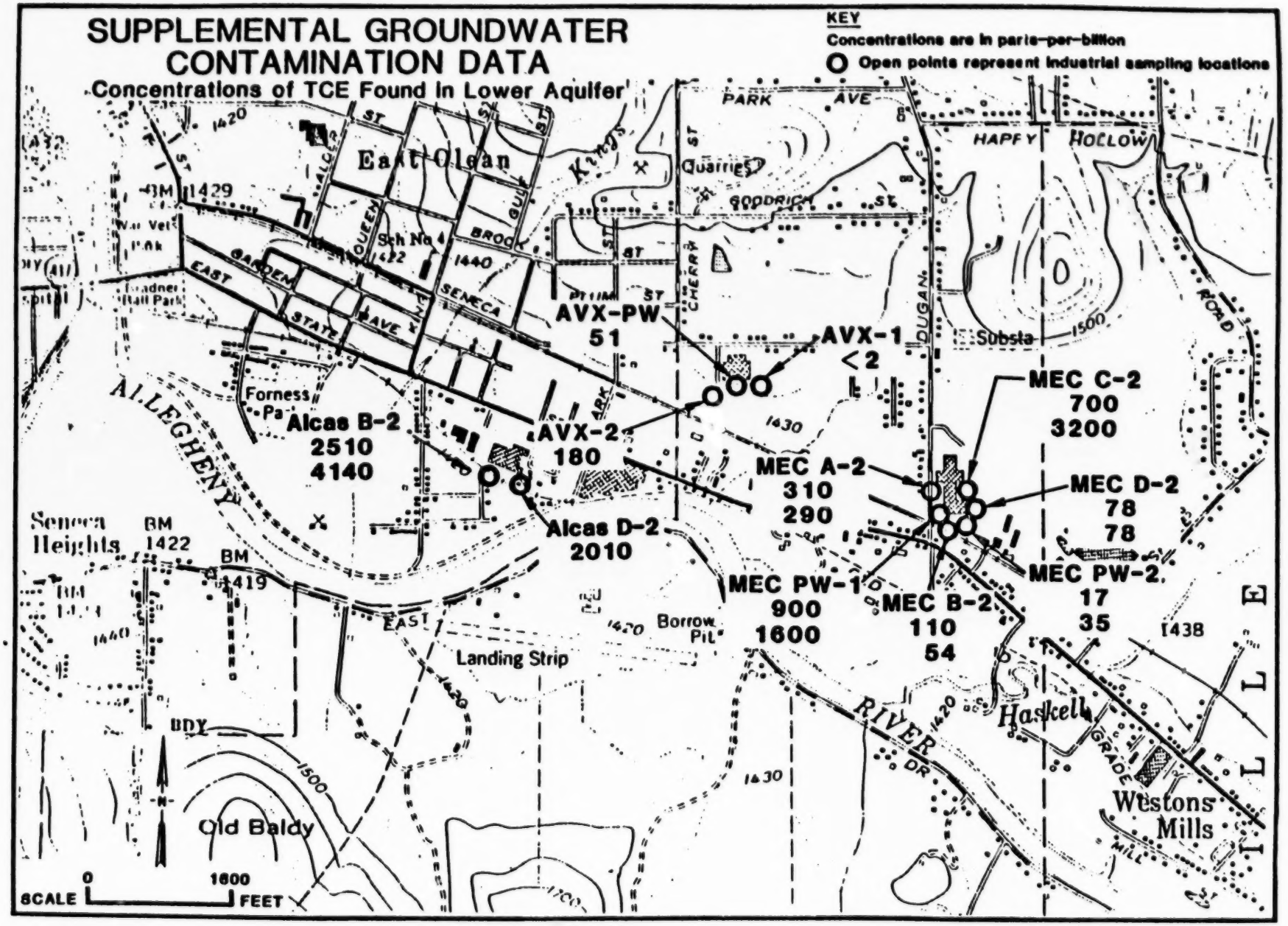
RESULTS OF SECOND-ROUND SAMPLING AND ANALYSIS OF GROUNDWATER FOR CHEMICAL PARAMETERS

Aquifer Unit	Well I.D.	Trichloro-ethylene	Tetrachloro-ethylene	1,2-dichloro-ethylene	1,1-dichloro-ethylene	1,1,1-trichloro-ethane	1,1-dichloro-ethane	Chloroform	Phenols	Lead	Other
N.Y. State "GA" Groundwater Standard		10	2	(50)*	(50)*	50	50	100	1	25	
Upper Aquifer	CW-1A	20	<2	<2	<2	<15	<2	<2			
	CW-1B	17	3	<2	<2	<8	<2	<2			
	CW-3B	6	6	<2	<2	<25	<2	<2			
	CW-4A	350	<2	<2	<2	<40	<2	<2	2	<2	
	CW-5A	<2	<2	<2	<2	<8	<2	<2			
	CW-7A	370	<2	14	<2	<15	<2	<2			
	SW-8	<2	<2	<2	<2	<2	<2	<2	<1	<2	
	CW-10B										
	CW-12B	<2	<2	<2	<2	<2	<2	<2			
	SW-14	190(220)	<2	100(110)	<2	<2	<2	<2	2	<2	
	CW-15A	160	<2	210	<2	<3	<2	<2	3	<2	
	CW-18A	7800	<10	<10	240	250	<10	<10	<1	<2	
Upper Aquitard	CW-13A	<2	<2	<2	<2	<15	<2	<2	3	<2	Cadmium=5
Upper Portion of Lower Aquifer	CW-3A	<2	<2	<2	<2	<2	<2	<2			
	CW-7	50	<2	<2	<2	<6	<2	<2			
	CW-9A	600	<2	<2	<2	<3	<2	<2	11	<2	
	CW-10A	10	8	65	<2	<3	<2	<2	6	2.9	
	CW-12A	<2	<2	<2	<2	<3	<2	<2	10	<2	
	CW-17B	<2	<2	<2	<2	<2	<2	<2			
	CW-19A	<2	<2	<2	<2	<2	<2	12(15)	<1	<2	
Mid-Portion Lower Aquifer	CW-17A	<2	<2	<2	<2	<2	<2	<2			
Lower Portion of Lower Aquifer	CW-1	<2	<2	<2	<2	<2	<2	<2			
	CW-3	<2	<2	<2	<2	<20	<2	<2			
	CW-4	5	<2	<2	<2	<3	<2	<2			
	CW-5	4	<2	<2	<2	<8	<2	<2			
	CW-9	110	<2	<2	<2	<2	<2	2	2	<2	
	CW-10	240(230)	<2	<2	<2	<40(<35)	<2	<2	2	<2	
	SW-11	2	<2	<2	<2	<2	<2	<2			
	CW-12	110	<2	<2	<2	<20	<2	<2	2	<2	
	CW-13	49	<2	<2	<2	<2	<2	<2	4	<2	Cadmium=5
	CW-15	<2	<2	<2	<2	<3	<2	<2	<1	<2	Arsenic=10
	CW-17	<2	<2	<2	<2	<2	<2	<2			
	CW-18	44	<2	<2	<2	<40	<2	<2			
	CW-19	4	<2	<2	<2	<?	<2	<2			

All values are in parts-per-billion.

* N.Y. State Dept. of Health maximum permissible concentration for individual synthetic organic chemicals in drinking water.

Replicate analyses shown in parentheses.



Reproduced from best available copy.

FIGURE 3

TABLE 2

SUPPLEMENTAL CHEMICAL PARAMETER DATA
FOR INDUSTRIAL FACILITY LOCATIONS

Industrial Facility / Hydrogeologic Unit	Well I.D.	Trichloroethylene		Tetrachloro-ethylene		Trans-1,2-dichloro-ethylene		1,1-dichloro-ethylene		1,1,1-trichloro-ethane		1,1-dichlor-ethane		Methylene Chloride		Chloroethane	
McGraw-Edison		(84-I)	(84-II)														
Upper Aquifer	A-1	9900	1400	3.1	<	36	<	49	<	17	97	55	27	4.8	<	<	-
	C-1	150	760	<	15	10	39	<	<	52	<	<	13	<	<	<	-
Upper Aquitard	B-1	2000	1800	3.6	<	94	<	79	<	60	25	62	11	2	<	69	-
	D-1	1680	5200	<	4.7	<	<	<	<	<	<	<	<	<	<	<	-
	E-1	32	<	<	<	<	<	<	<	<	<	<	<	22	<	<	-
Lower Aquifer	PW-1	900	1600	<	<	320	<	<	<	30	<	<	<	4.6	<	<	-
	PW-2	17	35	<	<	<	<	<	<	<	<	<	<	<	<	<	-
	A-2	310	290	<	<	5.3	<	<	<	3.2	<	6.7	<	1.9	<	<	-
	B-2	110	54	<	<	<	<	<	<	<	<	<	<	2.6	<	<	-
	B-3	6400	1600	6	20	89	35	39	<	160	<	16	<	<	<	43	-
	C-2	700	3200	11	14	19	<	<	<	111	<	38	<	<	<	<	-
	D-2	78	78	<	<	<	<	<	<	<	<	<	<	<	<	<	-
AVX		(11/84)															
Upper Aquitard	3	270		210		200		14		1100		950		TR		280	
Lower Aquifer	1	<		<		<		<		<		<		<		<	
	2	180		<		<		<		<		<		<		<	
	PW	51		<		<		<		<		<		<		<	
Alcas		(12/84)															
Upper Aquifer	B-1	76		<		<		<		<		<		<		<	
Lower Aquifer	B-2	2510(4140)		<		1150(1080)		<		<		<		<		<	
	D-2	2010		<		<		<		<		<		<		<	

(<) Indicates parameter not detected.
(-) Indicates data not provided.
(TR) Indicates trace quantity detected.
Replicate analyses shown in parentheses.
All values are in parts-per-billion.
Sources of Data: Losier/Groundwater Associates, Hydrogeologic Investigation at the McGraw-Edison Facility, November 28, 1984.
Geraghty & Miller, Inc., Hydrogeologic Investigation at the AVX Facility, January 23, 1985.
Ecology and Environment, Inc., Hydrogeologic Investigation at the Alcas Cutlery Facility, January 18, 1985.

TABLE 2 (cont'd)

RESULTS OF INDUSTRIAL SITE SOIL CONTAMINATION TESTING
(all values in parts-per-billion, except where indicated)

Industrial Site		TCE	Tetrachloro-ethylene	Trans-1,2-dichloro-ethylene	1,1,1-trichloro-ethane	1,2-dichloro-ethane	1,1-dichloro-ethane	Methylene Chloride	Toluene
Alcas*		<100	<100	<100	<100	<100	<100	<100	<100
AVX-									
Surficial Soil	102	2	10	<	<		<		
	105	<	3	1	<		2		
	106	<	4	<	<		4		
	107	8	27	64	240		32		
	108	1	4	1	<		3		
	109	1	5	<	<		3		
	113	42	6	100	54		2		
	115	<	4	<	<		<		
	116	2	4	7	28		7		
	117	150	56	27	220		8		
Soil Borings									
AVX-1	0-15 ft.	20	300	25	3		5		
	19-33	<	<	<	<		<		
	34-46	1	<	<	<		<		
	49-61	1	<	<	<		<		
	64-76	<	<	<	<		<		
AVX-2	0-16 ft.	<	<	<	<		<		
	19-31	<	<	<	<		<		
	34-46	<	<	<	<		<		
	49-61	1	<	<	<		<		
	64-76	24	<	<	<		<		
McGraw-Edison- Soil Borings									
SB-73	10 ft.	<	<	<	<	<	16	69	4.3
	22	<	<	<	<	<	<	44	<
SB-74	0	620	510	10	38	<	<	180	17
	5	17	<	33	13	<	11	24	6.2
	10	<	<	<	<	<	<	20	<
	15	13	<	<	<	<	<	13	<
SB-76	5	<	<	<	<	<	<	<	<
	15	<	<	<	<	<	<	<	<
SB-77	15	5000	<	<	200	<	<	<	<
SB-78	5	<	<	<	<	<	<	12	6.7
	10	1300	<	<	<	<	<	<	<
	14	200	<	<	<	<	<	<	60

TABLE 2 (cont'd)

RESULTS OF INDUSTRIAL SITE SOIL CONTAMINATION TESTING
(all values in parts-per-billion, except where indicated)
(Continued)

Industrial Site		TCE	Tetrachloro-ethylene	Trans-1,2-dichloro-ethylene	1,1,1-trichloro-ethane	1,2-dichloro-ethane	1,1-dichloro-ethane	Methylene Chloride	Toluene
SB-79	1	43	<	29	<	<	<	.54	<
	5	<	<	<	<	<	<	<	140
	10	<	<	<	<	<	<	<	<
	15	<	<	<	<	<	<	<	<
SB-80	1	<	<	<	<	<	<	<	<
	5	<	<	<	<	<	<	<	<
	10	<	<	<	<	<	<	<	<
	15	1400	<	<	<	<	<	<	<
SB-81	2	<	<	<	<	<	<	<	<
	5	<	<	<	<	<	<	<	<
	10	<	<	<	<	<	<	<	<
	15	<	<	<	<	<	<	<	<
SB-82	1	<	<	<	<	<	<	<	<
	5	<	<	<	<	<	<	<	<
	10	<	<	<	<	<	<	6.1	<
	15	<	400	<	<	<	<	<	<
SB-83	1	<	<	<	<	<	<	<	<
	5	<	<	<	<	<	<	8.5	<
	10	300	<	<	<	<	<	6.1	<
	15	400	<	<	<	<	<	8.5	<
SB-84	1	2400ppm	4800	45000	4800	<	300	920ppm	530
	5	250ppm	2300	4400	300	2000	<	72ppm	1300
	10	1400	<	<	<	<	<	700	<
SB-85	1	<	<	<	<	<	<	<	<
	5	<	<	<	<	<	<	<	<
	10	<	<	<	<	<	<	<	<
SB-86	1	680	80	1600	380	<	110	150	4400
	5	5700	<	1600	<	<	<	<	<
	10	600	<	<	<	<	<	<	<
SB-87	1	8.3	<	37	<	<	<	17	<
	5	<	<	<	<	<	<	<	<
	10	<	<	<	<	<	<	<	<

* Laboratory analysis of 8 Soil Boring samples from Alcas-82 showed concentrations of VOC's less than 100 ppb. However, air scanning of soil at time of sampling indicated VOC contamination (10 to 20 ppm, as measured by OVA in air) in upper five feet of soil.

Sources of Data: Lozier/Groundwater Associates, Hydrogeologic Investigation at the McGraw-Edison Facility, November 28, 1984.
Geraghty & Miller, Inc., Hydrogeologic Investigation at the AVX Facility, January 23, 1985.
Ecology and Environment, Inc., Hydrogeologic Investigation at the Alcas Cutlery Facility, January 18, 1985.

Reproduced from best available copy.

TABLE 3

HIGHEST LEVELS OF TCE CONTAMINATION

DETECTED AT OLEAN INDUSTRIAL SITES

	SOIL	GROUND WATER
McGRAW-EDISON	2,400 ppm	6,400 ppb
AVX	250 ppb	15,000 ppb
ALCAS CUTLERY	10-20 ppm (OVA readings)	12,000 ppb

TABLE 4A

IDENTIFICATION AND PRELIMINARY SCREENING OF REMEDIAL ACTION ALTERNATIVES FOR PUBLIC WATER SUPPLIES

Alternative No.	Alternative Description	Cost	Environmental Impact	Public Health Risk	Regulatory Compliance	Technology	Engineering Judgment Comments	Retain Option
1.	No action/continue operation of surface water treatment plant	2	2	2	2	2	o High operation and maintenance costs o Surface water susceptible to short-term pollution o Reliability of plant uncertain (not a long-term solution) o Discharge of alum sludge to Olean Creek is an environmental and regulatory concern	No
2.	No action/ reactivate wells without treatment of groundwater	3	2	2	1	3	o Concentrations of trichloroethyene in excess of guidance and proposal regulations o Not a long-term solution	No
3.	Purchase existing wells beyond contaminated area	2	2	3	3	2	o Pumping of wells may draw contamination to wells	No
4.	Construct replacement surface water treatment plant	1	3	2	3	3	o Source of water susceptible to short-term pollution o High capital cost o High operation and maintenance costs o Drinking water quality acceptable by current regulations	Yes
5.	Reactivate wells and construct treatment system to remove trichloroethylene to <5 ppb	2	3	3	3	3	o Contaminants amenable to treatment by air stripping or carbon adsorption, o Potential air pollution problem with air stripping, may require vapor phase adsorption o Drinking water quality acceptable by current regulations and guidance	Yes
6.	Construct new wells beyond contaminated area	2	2	3	3	3	o Geographic extent of contamination would limit suitable locations for wells o Pumping of wells may draw contamination to wells	Yes

Legend: 1 = unfavorable
2 = fair
3 = favorable

TABLE 4B

IDENTIFICATION AND PRELIMINARY SCREENING OF REMEDIAL ACTION ALTERNATIVES FOR PRIVATE WELLS

Alternative No.	Alternative Description	Cost	Environmental Impact	Public Health Risk	Regulatory Compliance	Technology	Engineering Judgment Comments	Retain Option
1.	No action	3	2	1	1	3	o No cost alternative o Drinking water quality not acceptable by current regulations and guidance o Potential health risk due to consumption and inhalation during hot water usage	No
2.	Continue monitoring, installation and maintenance of carbon adsorption units as required	2	2	2	3	2	o High, long-term analytical and maintenance costs o Difficult to predict time to breakthrough, because of varying concentrations o Drinking water quality acceptable by current regulations and guidance	Yes
3.	Install carbon adsorption units on all wells in Zone 1 and continue to monitor and replace carbon when detectable levels are found	2	2	2	3	2	o High, long-term analytical and maintenance costs o Difficult to predict time to breakthrough, because of varying concentrations o Drinking water quality acceptable by current regulations and guidance	Yes
4.	Extend water line from City limits to Dugan Road and tie into City of Olean water supply network (50 hookups)	3	2	3	3	3	o Low cost alternative o Eliminates sampling and analytical requirements for approximately 50 private wells o Drinking water quality acceptable by current regulations and guidance	Yes
5.	Extend water line from City limits to Haskell Road and tie into City of Olean water supply network (93 hookups)	3	2	3	3	3	o Low cost alternative o Eliminates sampling and analytical requirements for approximately 93 private wells o Drinking water quality acceptable by current regulations and guidance	Yes
6.	Develop public water supply for residents and businesses in impacted area in Town of Olean, including source and distribution network	1	2	3	3	3	o Water from well(s) in impacted area will require treatment o Eliminates sampling and analytical requirements for private wells o Drinking water quality acceptable by current regulations and guidance	No
7.	Bottled drinking water	2	2	2	3	3	o Minimizes sampling and analytical requirements for private wells o Drinking water quality acceptable current regulations and guidance o Potential public health risk, due to inhalation during hot water usage o Not a long-term solution	No

Legend: 1 = unfavorable 2 = fair 3 = favorable

TABLE 4C

IDENTIFICATION AND PRELIMINARY SCREENING OF REMEDIAL ACTION ALTERNATIVES FOR GROUNDWATER CONTAMINATION CONTROL

Alternative No.	Description	Cost	Technology	Public Health Risk	Environmental Impact	Regulatory Compliance	Engineering Judgement Comments	Retain Option
1	No Action	3	NA	1	1	1	o Unacceptable risks to human health and environment, and unfavorable regulatory compliance	No
2	Monitoring/Site Maintenance	2	3	2	2	3	o Continue monitoring extent of contamination o Deteriorating groundwater quality triggers Contamination Source Investigation and subsequent Source Control Action o No active response to sources or contaminated groundwater	Yes
3	Delineation of Sources	2	3	2	2	3	o Define contamination sources o Provide information necessary for source control	Yes
	Contamination Source Control:							
4	Removal and Disposal of Contaminated Soil	1	3	2	2	3	o Removal of highly-contaminated soils and residual waste material to secure landfill o Long-term solution to site contamination o Cost dependent upon extent of contamination source clean-up o Some risk associated with transportation and disposal o Option not retained due to inadequate source characterization	No
5	Treatment of Contaminated Soil	2	1	3	3	3	o In-situ or on-site soil decontamination o Biological, physicochemical, and thermal processes for soil treatment are developing technologies o Would require extensive testing prior to use	No
6	Contamination Source Containment	2	3	2	2	3	o Containment employing capping and leachate collection to isolate sources o Failure of containment renews contamination hazard o Option not retained due to inadequate source characterization	No

TABLE 4C (cont'd)

IDENTIFICATION AND PRELIMINARY SCREENING OF REMEDIAL ACTION ALTERNATIVES FOR GROUNDWATER CONTAMINATION CONTROL

Alternative No.	Alternative Description	Cost	Technology	Public Health Risk	Environmental Impact	Regulatory Compliance	Engineering Judgement Comments	Retain Option
7	Repair/Replacement of Leaky Industrial Sewer	2	3	3	3	3	o Eliminate conduit for contamination migration o Repair or replacement depend: upon degree of damage sustained by pipeline	Yes
	Groundwater Rehabilitation:							
8	Pumping and Treatment of Contaminated Groundwater	2	3	3	3	3	o Extract and decontaminate groundwater, removing VOC contaminants from aquifers o Long-term operation and maintenance commitment o Effectiveness dependent upon discontinuation of groundwater contamination sources	Yes

3 = Favorable; 2 = Fair; 1 = Unfavorable; NA = Not Applicable.

TABLE 5A

SUMMARY OF PREFERRED REMEDIAL ALTERNATIVES FOR CITY WATER SUPPLY

Alternative No.	Description	Regulatory Acceptability	Environmental Impacts	Costs: Present Value ($)	Costs: Annual Cost ($/yr)	Comments
4	Construct Replacement Surface Water Treatment Plant	Acceptable	o Groundwater contamination still a problem., Would require other actions for remediation of groundwater	14,370,000	1,52(,000	o Replacement plant more reliable than existing plant. Water could be made available to users of private wells o Highest overall cost
5	Treatment of Contaminated Groundwater:					
	o Air Stripping	Probably Acceptable	o Will contribute to groundwater remediation o No adverse impacts on air or surface water quality	8,360,000	890,000	o Demonstrated technology o Will contribute to groundwater remediation o Lowest capital cost o Least costly alternative overall o Pilot testing required prior to design and construction to confirm VOC removals
	o Activated Carbon Adsorption	Probably Acceptable	o Will contribute to groundwater remediation o No adverse impacts on air or surface water quality	13,520,000	1,430,000	o Demonstrated technology o Will contribute to groundwater rehabilitation o Higher capital and O&M costs than air stripping o Pilot testing required prior to design and construction to confirm VOC removals
	o Combined Air Stripping and Activated Carbon Adsorption	Probably Acceptable	o Will contribute to groundwater remediation o No adverse impacts on air or surface water quality	13,400,000	1,420,000	o Demonstrated technology o Will contribute to groundwater rehabilitation o Higher capital and lower O&M costs than carbon alone o Pilot testing required prior to design and construction to confirm VOC removals

TABLE 5B

SUMMARY OF PREFERRED REMEDIAL ALTERNATIVES FOR PRIVATE WELLS

Alternative				Costs		
No.	Description	Regulatory Acceptability	Environmental Impacts	Present Value ($)	Annual Cost ($/yr)	Comments
2	Continue Monitoring, Installation and Maintenance of Carbon Adsorption Units as Required	Probably Acceptable	o No adverse environmental impacts	2,413,000	256,000	o High long-term analytical and maintenance costs o Drinking water quality generally acceptable, but potential for short-term exposure to VOC's exists
3	Install Treatment Systems on All Wells in Zone 1 and Continued Monitoring and Maintenance of Carbon Adsorption Units as Required	Probably Acceptable	o No adverse environmental impacts	2,651,000	281,000	o High long-term analytical and maintenance costs o Drinking water quality generally acceptable, but potential for short-term exposure to VOC's exists
4	Extend Water Line from City Limits to Dugan Road and Tie into City of Olean Water Supply Network (50 Hookups)	Probably Acceptable	o No adverse environmental impacts	1,431,000	152,000	o Higher capital cost than continued use of carbon adsorption in Zone 1 o Reduced long-term analytical and maintenance costs o Reduced risk of short-term exposure to VOC's
5	Extend Water Line From City Limits to Haskell Road and to 3 homes south of the River and tie into City of Olean Water Supply Network (93 Hookups).	Probably Acceptable	o No adverse environmental impacts	962,000	101,950	o Higher capital cost, but significantly lower analytical and maintenance costs o Best protects public against risk of short- or long-term exposure to VOC's

TABLE 5B (cont'd)

SUMMARY OF PREFERRED REMEDIAL ALTERNATIVES FOR CITY WATER SUPPLY

Alternative		Regulatory Acceptability	Environmental Impacts	Costs		Comments
No.	Description			Present Value ($)	Annual Cost ($/yr)	
6	Construct New Wells Beyond Contaminated Area	Acceptable	o Groundwater contamination still a problem. Would require other actions for remediation of groundwater	11,020,000	1,170,000	o Water could be made available to users of private wells o Selection of location of wells is required

PRIVATE WELL ZONE DESIGNATIONS

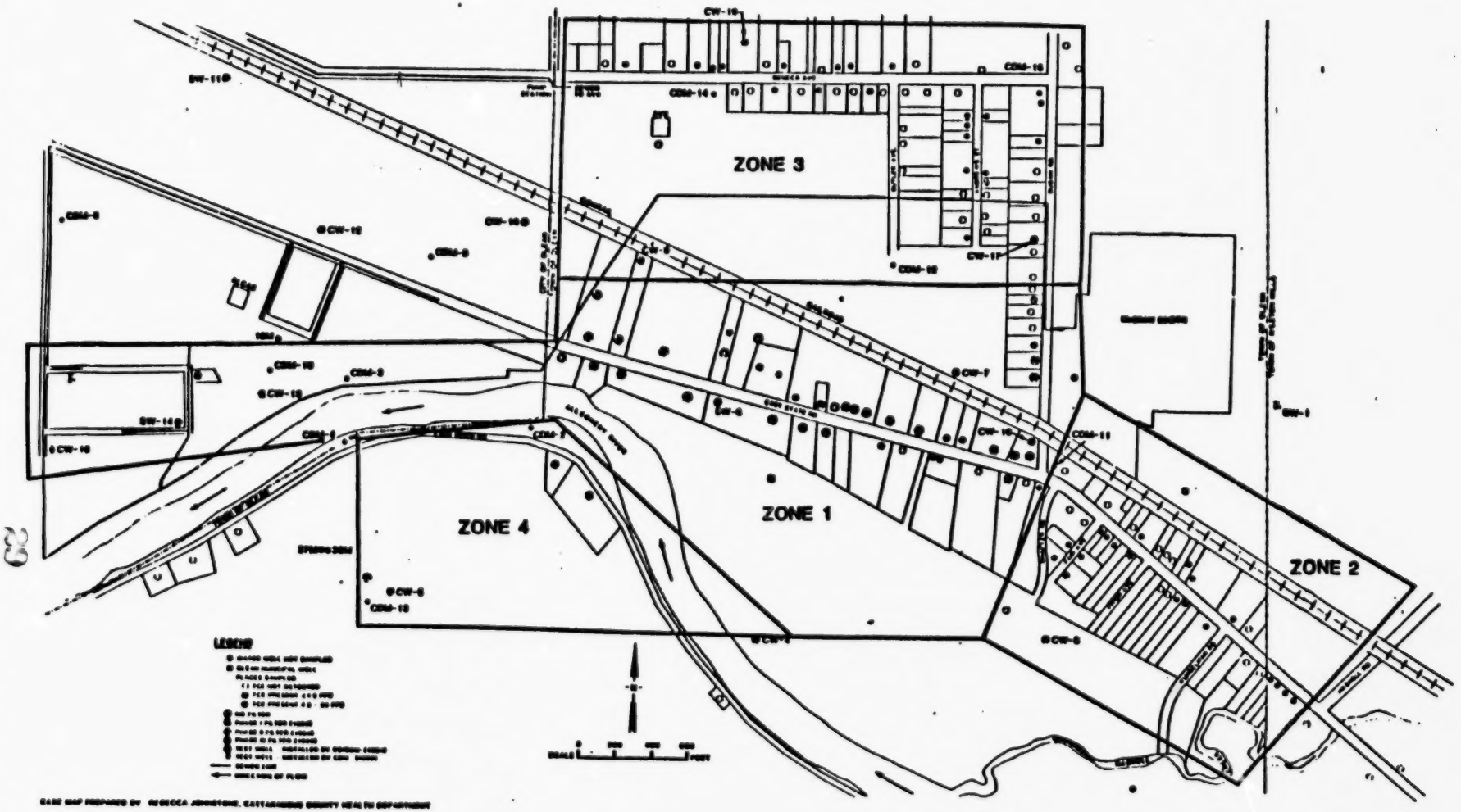


FIGURE 4

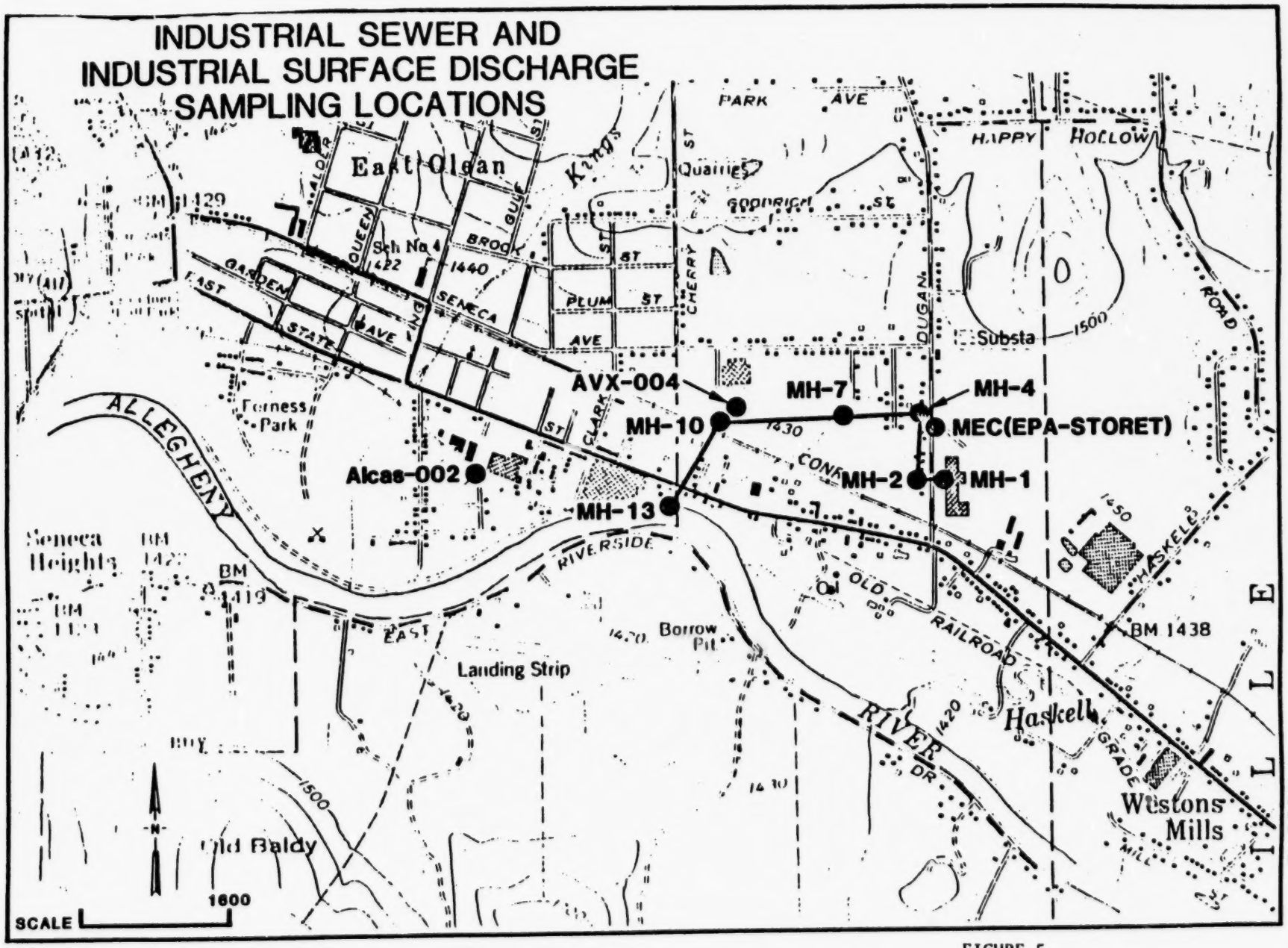


FIGURE 5

Reproduced from best available copy.

TABLE 6

COST OF RECOMMENDED ALTERNATIVE

	CAPITAL COST (1985 Dollars)	OPERATION & MAINTENANCE COST (Annual expense)
CITY PUBLIC WATER SUPPLY		
Reactivation of Municipal Wells w/TCE Removal Equip.	$ 1,245,400	$ 721,700[1]
TOWN PUBLIC WATER SUPPLY		
Extend City water line to 93 private Town wells	656,380	27,200
Monitor remaining private Wells		5,200[2]
GROUND WATER CONTAMINATION CONTROL		
Inspect Industrial Sewer	15,000	
Permanent Easements on Monitoring Wells	80,000	36,940[3]
Additional field work and Analyses (2nd operable unit)	500,000	
TOTAL		
(w/o additional field work)	1,996,780	799,040

NOTES:

1. Additional O&M cost for TCE removal is $110,200. The City of Olean is responsible for the remaining $611,500 which is their regular maintenance cost.

2. Quarterly sampling of 10% of the wells in Zone 3 (North of areas known to be contaminated).

3. Maintenance and monitoring of monitoring wells.

New York State Department of Environmental Conservation has agreed to pay for 10% of the Capital costs for this project in addition to the O&M costs ($799,040-$611,500=$179,540) after the first year.

COMMUNITY RELATIONS RESPONSIVENESS SUMMARY

OLEAN WELL FIELD

INTRODUCTION

This responsiveness summary documents the concerns and issues raised during remedial planning and the comment period.

CONCERNS RAISED PRIOR TO THE FEASIBILITY STUDY COMMENT PERIOD

A Citizen's Advisory Committee (CAC) was established in April 1984 to serve as a link between the community and the NYSDEC and EPA during the RI/FS process. The CAC and the Mayor of Olean generally have expressed interest in limiting government expenditures in Olean so as to relieve the potential burden on industry, apparently fearing loss of jobs and tax base. A representative of EPA or NYSDEC was present at each of the seven CAC meetings to answer questions and receive comments.

CONCERNS RAISED DURING THE COMMENT PERIOD

The public comment period began on May 24, 1985. Letters were sent to 250 residents, Town and City officials, and the business community located within the area of concern notifying them of the public meeting, the locations of the three repositories holding the RI/FS for public review and the closing date of the public comment period. Simultaneously, the PRPs were forwarded the RI/FS report. Shortly thereafter, local government officials and CAC members requested additional time to review the RI/FS and present the proposed alternative to their respective legislatures. EPA then extended the public comment period to August 5, 1985.

A public meeting was held on June 24, 1985 at the Olean Municipal Building to discuss the RI/FS report for the Olean Well Field Site and to accept public comments. After introductions by Paul Schafer, Chairman of the CAC, Richard Dana, Project Manager for NYSDEC, and George Pavlou of EPA, Ernest Schroeder of Engineering-Science (New York State's consultant for this project) gave his presentation. Mr. Schroeder briefly described the hydrogeology present at the site, the areas and types of contamination, each of the remedial alternatives considered during the RI/FS and the recommended alternative. A schedule for the design and construction of the recommended alternative was also given.

Five residents offered questions or comments. Most of the comments centered on the Town residents' concern that they would have to pay high prices (or pay at all) for their water once they are hooked up to the City water supply. At the present time they don't pay any fees and they maintain their own well pumps. A fee schedule for City water is an institutional problem to be worked out by the City and the Town officials since the Operation & Maintenance (O&M) for TCE removal will not cover the regular costs incurred by the City Water Department. The Town residents felt

that they shouldn't have to pay for clean water as their private wells were not contaminated through any fault of their own.

Another concern raised by the residents and previously raised by the CAC is the risk to public health resulting from trihalomethanes (THM) present in the treated water from the surface water treatment plant vs. the risk from TCE present in the municipal well water. It was explained to the residents that the level of THMs present in the City's drinking water is well below New York State's and EPA's Standard of 100 ppb while the level of TCE present in the municipal wells and private wells greatly exceeds the Guidelines set forth by New York State and EPA. It was also explained that THMs are a byproduct of chlorination and are to a large degree controllable according to the level of chlorine disinfection required. TCE, on the other hand, entered the ground water through uncontrolled deposits, dispersing unevenly. Therefore, the ground water may show greatly fluctuating levels of contamination when extracted.

There was also concern that some private wells which would not be connected to the public water suipply under the recommended alternative might go dry when the municipal wells are turned on. This problem has in fact occurred in the past when all three municipal wells were pumping. If reestablishment of the municipal wells as a source of water for the City does cause some private wells to go dry, it would not present a new problem to private well users. The possible reoccurence of an old problem should be settled by City and Town governments as an institutional issue.

In addition to the comments received at the meeting, written comments were received from the CAC, Cattaraugus County Department of Health (CCDOH), AVX Ceramics Corp. and Cooper Industries in conjunction with McGraw-Edison. The following summarizes the issues raised by those commenters.

All commenters stated that they believed the source control analysis in the RI/FS to be inadequate. Cooper Industries stated "that the remedial investigation simply concentrated on three industrial users and diliberately chose to ignore the widespread use and disposal of TCE". The Seneca Avenue Landfill, an oily lagoon located on Mastel Ford property on East State Street, Olean Clean All, a dry cleaner on East State Street, residential septic tanks possibly cleaned with TCE, Olean Tile Company disposal sites, the Butler and Andrews Street dump and the dumping area on Olean Olean Steel, Sales and Service property northeast of McGraw-Edison were identified by the PRPs as other possible sources of TCE contamination. In addition, the respondents stated that the RCRA §3013 data were not taken into consideration during the Remedial Investigation.

On the other hand, the PRPs stated that EPA's recommendation to conduct an additional sampling program and further evaluate source control measures is unnecessary and should not be considered unless the air strippers on the municipal wells are ineffective.

EPA believes that identifying major sources and evaluating the cost-effectiveness of source control measures, and, if necessary, implementation of such measures, is a cost-effective approach for addressing the issue of ground water contamination at this site. Eliminating active sources and managing contaminant migration from passive sources may effectively reduce future migration of contaminants away from these sources and into the ground water.

In order to evaluate the merits of source control measures at the site, additional information is necessary. Suspected areas of contamination should be examined further in order to confirm whether or not these areas are sources of contamination. It is also necessary to further delineate the known sources of contamination. Therefore, EPA is recommending an additional investigatory phase to address evaluation of source control measures. Work has already commenced in an effort to identify any other possible contributors to the TCE problem at the site. Information request letters have been issued in order to determine other users and potential sources of TCE contamination. The responses to those requests are being evaluated. However, those responses appear not to indicate further TCE use or disposal. In addition, sampling and analysis has been performed on the contents of the lagoon at Mastel Ford to determine if the lagoon is an active source of contamination. The analytical results indicate only minor concentrations (14 ppb) of TCE (minor as compared to confirmed sources of TCE contamination). Consequently, at this point in time, EPA has targeted the industrial sites, as well as, the Seneca Avenue Landfill and Butler/Andrew Street Dump as the subject of the proposed investigation. Additional areas may be included in the study once EPA ascertains their potentiallity for contributing to the contamination problem at the site.

A major issue raised by AVX was the validity of the ground water model used by Dames & Moore, subcontractors to Engineering-Science. They felt that the RI/FS relied too heavily on the results of this modelling effort. Additionally, they objected to their inability to evaluate the model due to D&M's claim that the model's code is proprietary information. The intended use of a ground water model at the Olean Well Field site was as a supplemental tool in characterizing the ground water flow regime and the transport of TCE in the study area. The results of the modelling effort were expected to assist in the determination of potential sources of contamination and in assessing the effectiveness of remedial measures.

For the purpose of the EPA Record of Decision regarding this site, source identification and evaluation of remedial alternatives can be based entirely on interpretation of existing data (including

the studies performed by Alcas, AVX, and McGraw-Edison pursuant to Section 3013 of RCRA).

Furthermore, EPA recognizes that restricting the availability of the data used in the modelling study and access to the model itself under a "business confidentiality claim" can severely limit independent evaluation of the validity of the model and its application.

Therefore, EPA has not relied on the results of the Dames & Moore modelling study in recommending the remedial action or identifying source areas.

The use of the Felmont Oil Company water wells in West Olean to supplement the City's water supply was raised as an alternative. AVX and CCDOH both commented that this alternative was not fully investigated during the RI/FS. As stated in the RI/FS, the two Twentieth Street Felmont wells are too close to other sites in West Olean contaminated with chromium and ammonia to be considered a viable alternative. Other Felmont wells, adjacent to the Allegheny River, were considered and also rejected since the Felmont Oil Company indicated that it was not interested in selling the wells, but, rather, only the water produced by these wells. Felmont proposed to initially grant a short-term lease of three years. EPA believes that this does not constitute a reliable, long-term solution to the problem at hand. This alternative also lacks a plume management program.

The CAC still favors the possibility of using a purge well to "quickly clean out" the aquifer. They state that "further study for installing a purge well .... is warranted" and that "if the consultant feels uncertain whether the benefits of enhanced ground water rehabilitation justifies the additional expense, then perhaps the consultant should undertake further study before closing the book on this option". EPA agrees with this approach and therefore is recommending a supplemental investigation which will more accurately determine the amount of TCE remaining in the soil and aquifers and will then re-evaluate the cost-effectiveness of using purge well(s).

AVX raised several issues concerning the hydrologeology as described in the draft RI/FS report prepared by NYSDEC's consultant. Based on an evaluation of the available geologic data, EPA believes that the geologic description in the draft RI/FS report should be modified with respect to the area of the AVX facility and south of the facility to the railroad tracks. The results of drilling around the AVX facility, the topographic character of the land, and the water levels in wells in that area all suggest that the upper aquifer as described in the draft report does not exist in this area. The water table occurs in the till, which is close to the surface in the region north of the railroad. However, EPA does not consider this to be an aquifer because of its low permeability.

EPA has considered what effect this modified version of the geology might have on the selection of a remedial action, and concludes that the remedial action would not be influenced by these changes.

AVX also commented on the method used to measure water levels and the water level (potentiometric) contour maps constructed from this data and presented in the draft RI/FS report. EPA has constructed a set of water level (potentiometric) contour maps of the area using steel tape water level measurements during stressed aquifer conditions (pumping of the municipal wells 18M and 37M) and non-stressed conditions (current site status, municipal wells in area of concern not pumping). Although these contour maps do differ from those presented in the draft report, EPA has evaluated the consequence of these differences on the selected remedy and finds them to be negligible. It is evident from pumping tests performed by both EPA and CDM that ground water flow from almost the entire study area will be directed towards the municipal wells when they are reactivated. The exception to this trend will be in the immediate vicinity of small pumping well centers (AVX, McGraw-Edison, Olean Wholesale). A computer modelling study of the site prepared by INTERA Technologies using the SWIFT model has predicted that the cones of influence of these wells are minimal when the municipal wells are pumping.

Also, AVX commented on the manner in which travel times were calculated in the draft report. EPA has calculated permeabilities based on pump test data and found the value for hydraulic permeabilities to be in the range of 500-1000 ft/day. Using this range of permeabilities and a porosity in the range of 0.2-0.4 results in a ground water velocity in the range of 0.075-0.3 ft/day (municipal wells not pumping). A comparison of these results to those calculated in the draft RI/FS report shows that the ground water velocity using permeabilities calculated from pump tests (which EPA believes to be more accurate than values obtained from slug tests) is significantly greater than that which is presented in the RI/FS report. Although these different values for ground water velocity may affect calculation of overall ground water cleanup times (which will be addressed in the recommended source delineation study), it would not impact the ability of the selected remedy to provide a cost-effective solution to the problem of supplying potable water to the Town and City of Olean.

The need for pilot testing was also questioned by AVX. EPA believes that the pilot scale testing is necessary to determine the strippers' efficiency in removing volatile organic contaminants present in the municipal wells. Additionally, vendors of equipment would provide performance guarantees based on the results of pilot testing.